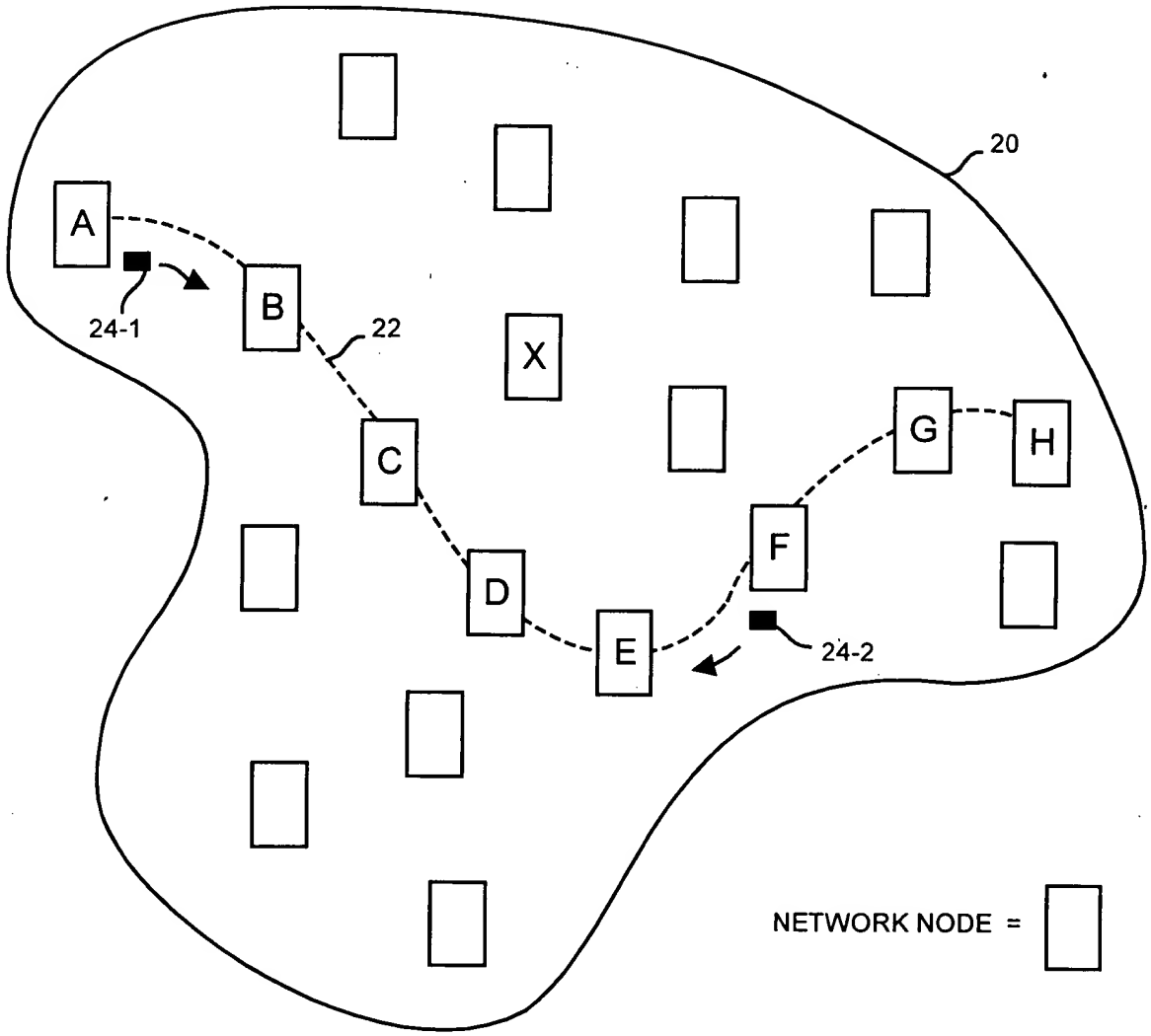

FIG. 1

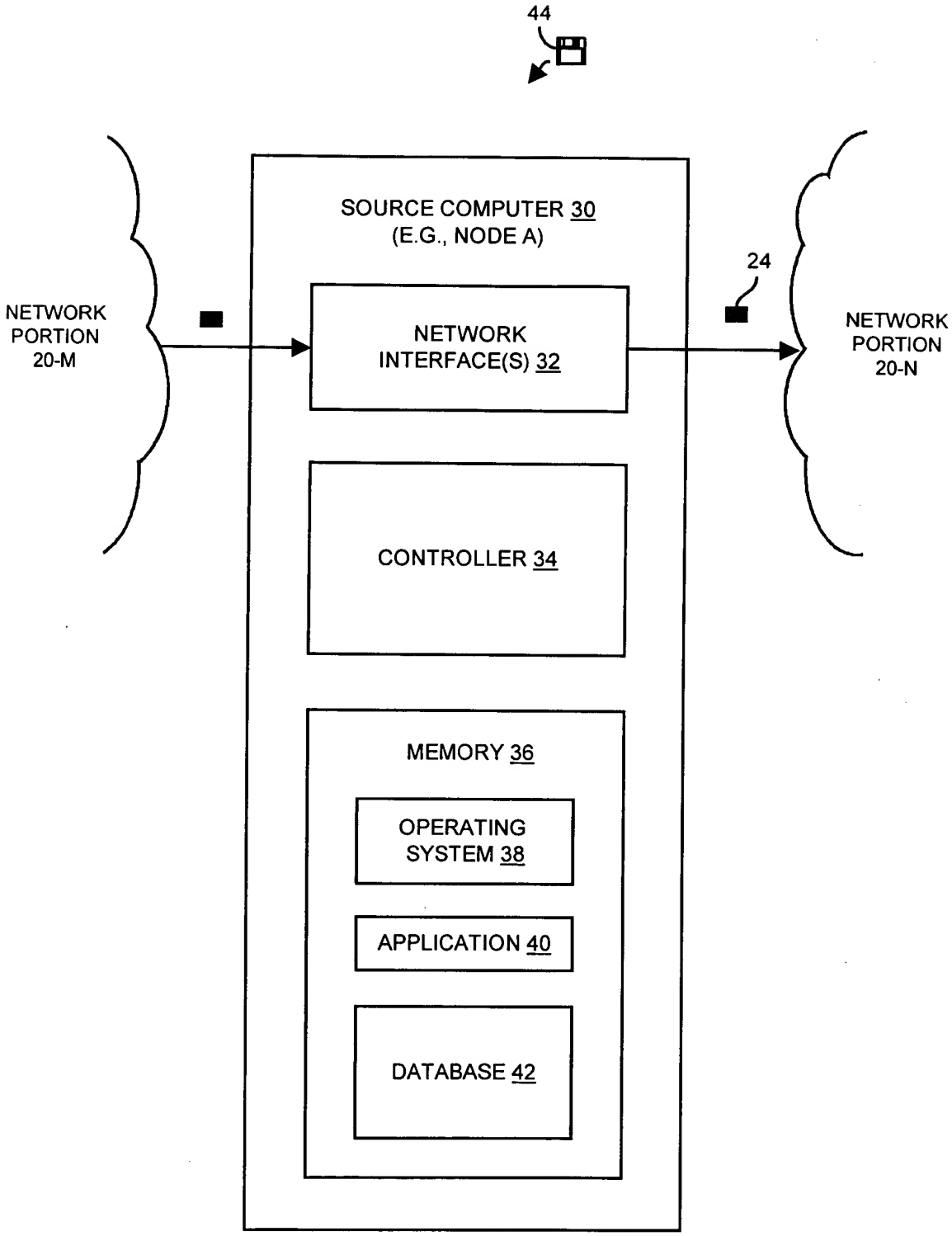
44
SOURCE COMPUTER 30
(E.G., NODE A)
NETWORK
PORTION
20-M
NETWORK
INTERFACE(S) 32
24
NETWORK
PORTION
20-N
CONTROLLER 34
MEMORY 36
OPERATING
SYSTEM 38
APPLICATION 40
DATABASE 42

FIG. 2

F 50	C 52	NUMBER 54	LENGTH 56	ID NUMBER 58
OUTBOUND HOP COUNT 60				RETURN HOP COUNT 62
ORIGINATOR IP ADDRESS 64				

FIG. 3

TYPE 70	CODE 72	CHECKSUM 74
ID NUMBER 76		UNUSED 78
OUTBOUND HOP COUNT 80		RETURN HOP COUNT 82
OUTPUT LINK SPEED 84		
OUTPUT LINK MTU 86		
RESOURCE USAGE INFORMATION (E.G., HISTORY) 88		

FIG. 4

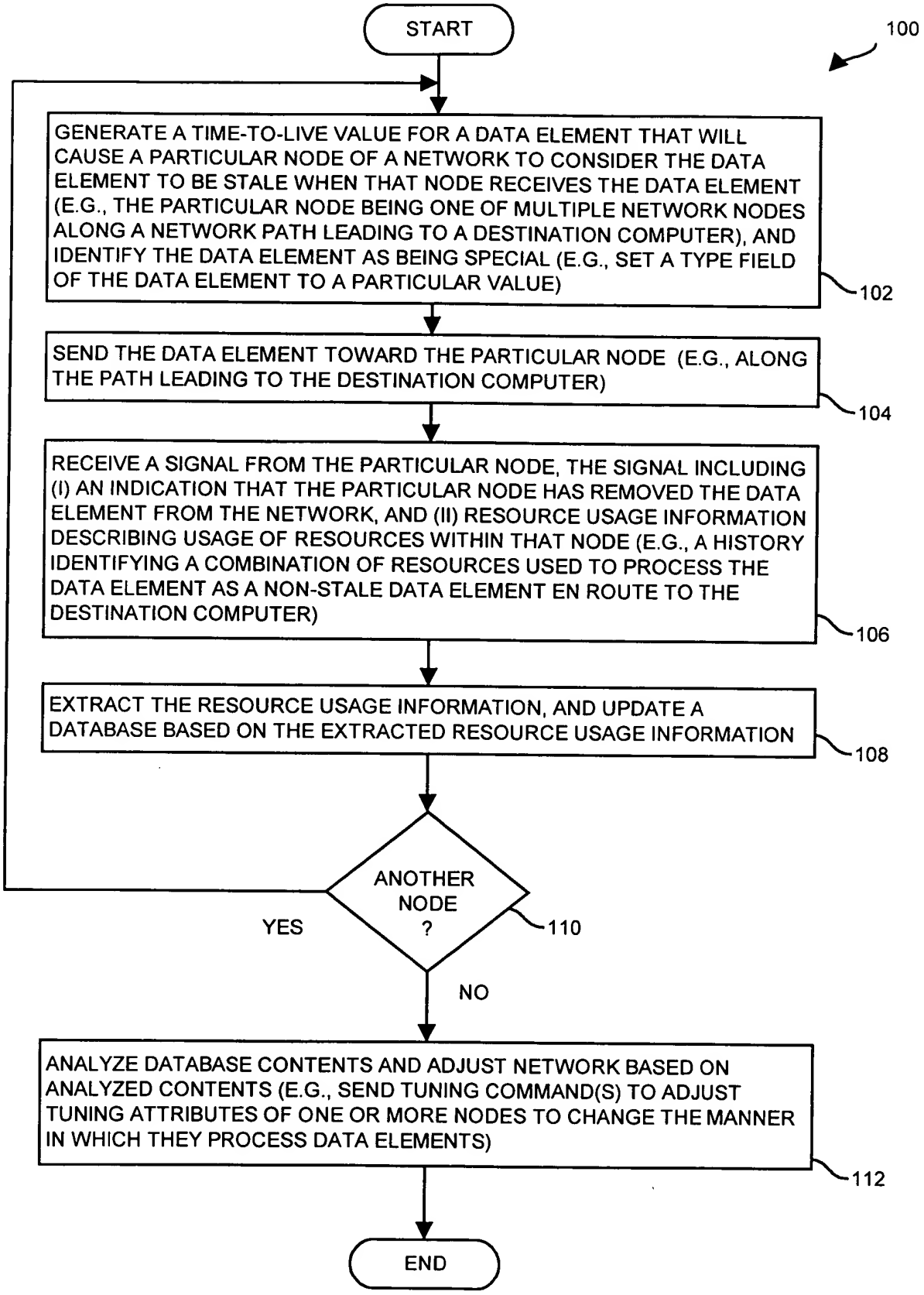
START
100
GENERATE A TIME-TO-LIVE VALUE FOR A DATA ELEMENT THAT WILL CAUSE A PARTICULAR NODE OF A NETWORK TO CONSIDER THE DATA ELEMENT TO BE STALE WHEN THAT NODE RECEIVES THE DATA ELEMENT (E.G., THE PARTICULAR NODE BEING ONE OF MULTIPLE NETWORK NODES ALONG A NETWORK PATH LEADING TO A DESTINATION COMPUTER), AND IDENTIFY THE DATA ELEMENT AS BEING SPECIAL (E.G., SET A TYPE FIELD OF THE DATA ELEMENT TO A PARTICULAR VALUE)
102
SEND THE DATA ELEMENT TOWARD THE PARTICULAR NODE (E.G., ALONG THE PATH LEADING TO THE DESTINATION COMPUTER)
104
RECEIVE A SIGNAL FROM THE PARTICULAR NODE, THE SIGNAL INCLUDING (I) AN INDICATION THAT THE PARTICULAR NODE HAS REMOVED THE DATA ELEMENT FROM THE NETWORK, AND (II) RESOURCE USAGE INFORMATION DESCRIBING USAGE OF RESOURCES WITHIN THAT NODE (E.G., A HISTORY IDENTIFYING A COMBINATION OF RESOURCES USED TO PROCESS THE DATA ELEMENT AS A NON-STALE DATA ELEMENT EN ROUTE TO THE DESTINATION COMPUTER)
106
EXTRACT THE RESOURCE USAGE INFORMATION, AND UPDATE A DATABASE BASED ON THE EXTRACTED RESOURCE USAGE INFORMATION
108
ANOTHER NODE ?
110
YES
NO
ANALYZE DATABASE CONTENTS AND ADJUST NETWORK BASED ON ANALYZED CONTENTS (E.G., SEND TUNING COMMAND(S) TO ADJUST TUNING ATTRIBUTES OF ONE OR MORE NODES TO CHANGE THE MANNER IN WHICH THEY PROCESS DATA ELEMENTS)
112
END

FIG. 5

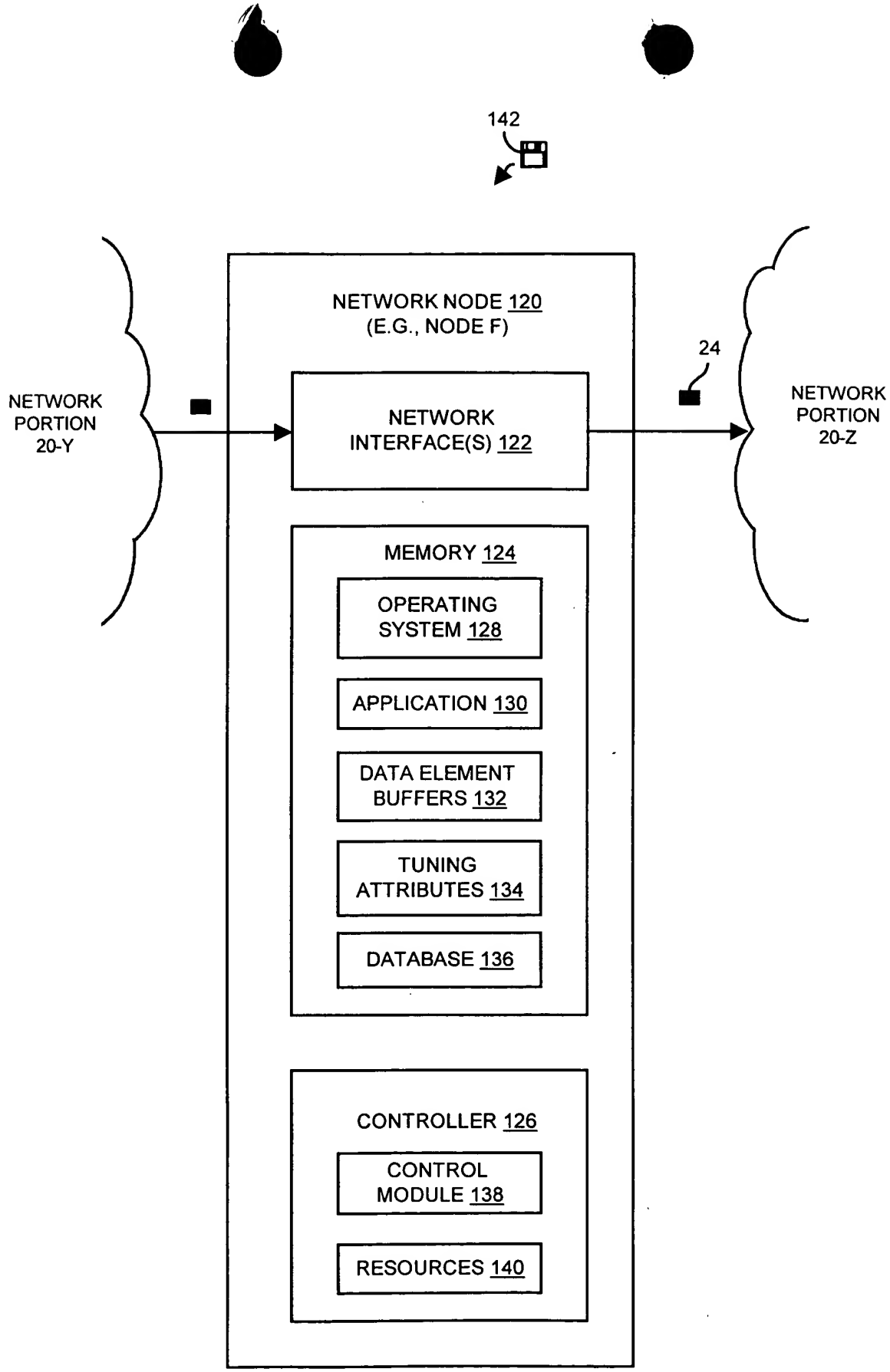
142
NETWORK NODE 120
(E.G., NODE F)
NETWORK
PORTION
20-Y
NETWORK
INTERFACE(S) 122
24
NETWORK
PORTION
20-Z
MEMORY 124
OPERATING
SYSTEM 128
APPLICATION 130
DATA ELEMENT
BUFFERS 132
TUNING
ATTRIBUTES 134
DATABASE 136
CONTROLLER 126
CONTROL
MODULE 138
RESOURCES 140

FIG. 6

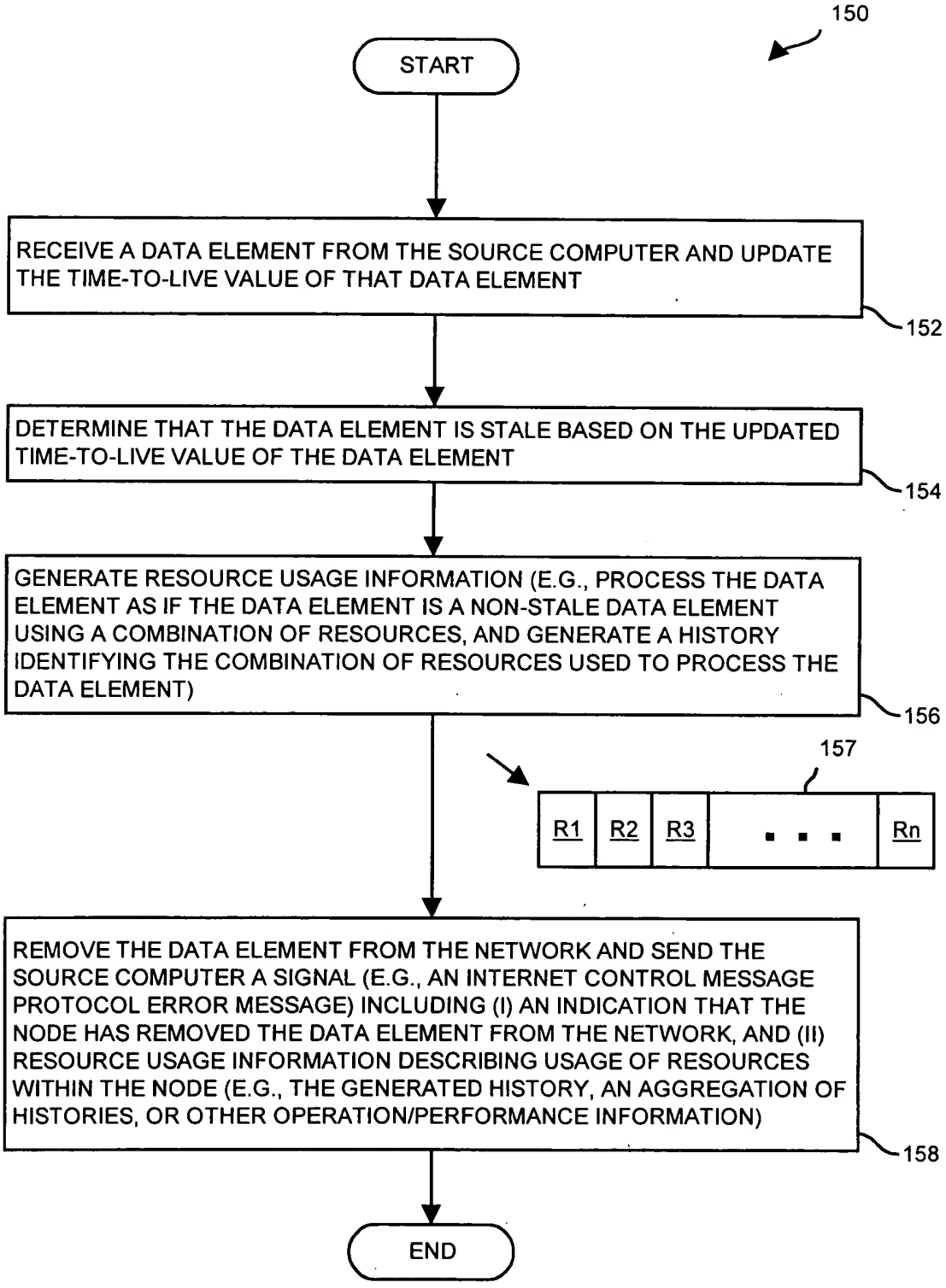
150
START
RECEIVE A DATA ELEMENT FROM THE SOURCE COMPUTER AND UPDATE THE TIME-TO-LIVE VALUE OF THAT DATA ELEMENT
152
DETERMINE THAT THE DATA ELEMENT IS STALE BASED ON THE UPDATED TIME-TO-LIVE VALUE OF THE DATA ELEMENT
154
GENERATE RESOURCE USAGE INFORMATION (E.G., PROCESS THE DATA ELEMENT AS IF THE DATA ELEMENT IS A NON-STALE DATA ELEMENT USING A COMBINATION OF RESOURCES, AND GENERATE A HISTORY IDENTIFYING THE COMBINATION OF RESOURCES USED TO PROCESS THE DATA ELEMENT)
156
157
R1
R2
R3
. . .
Rn
REMOVE THE DATA ELEMENT FROM THE NETWORK AND SEND THE SOURCE COMPUTER A SIGNAL (E.G., AN INTERNET CONTROL MESSAGE PROTOCOL ERROR MESSAGE) INCLUDING (I) AN INDICATION THAT THE NODE HAS REMOVED THE DATA ELEMENT FROM THE NETWORK, AND (II) RESOURCE USAGE INFORMATION DESCRIBING USAGE OF RESOURCES WITHIN THE NODE (E.G., THE GENERATED HISTORY, AN AGGREGATION OF HISTORIES, OR OTHER OPERATION/PERFORMANCE INFORMATION)
158
END

FIG. 7

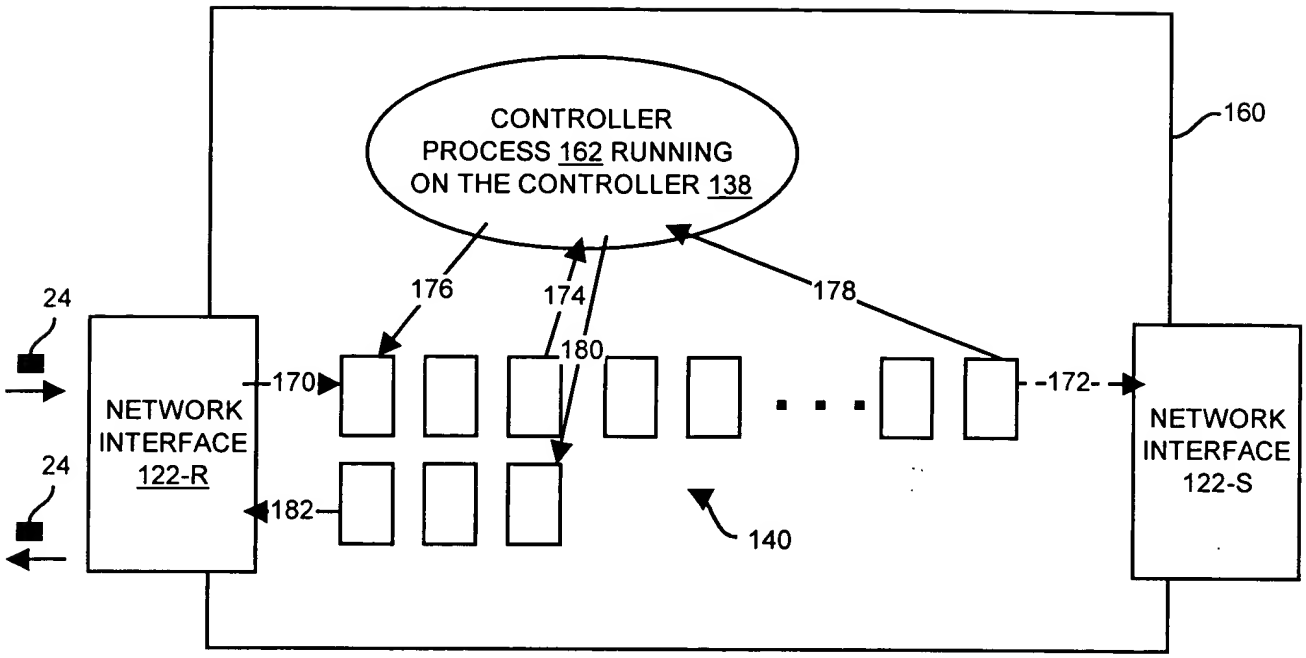
CONTROLLER
PROCESS 162 RUNNING
ON THE CONTROLLER 138
160
176
174
178
180
24
24
NETWORK
INTERFACE
122-R
170
182
172
140
NETWORK
INTERFACE
122-S

FIG. 8